(No Model.)

J. W. CLOUD.

WHEEL HUB.

No. 519,807. Patented May 15, 1894.

Fig. 3.

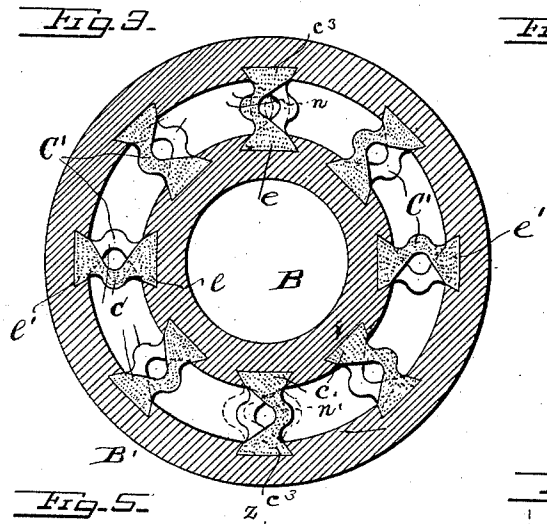


Fig. 4.

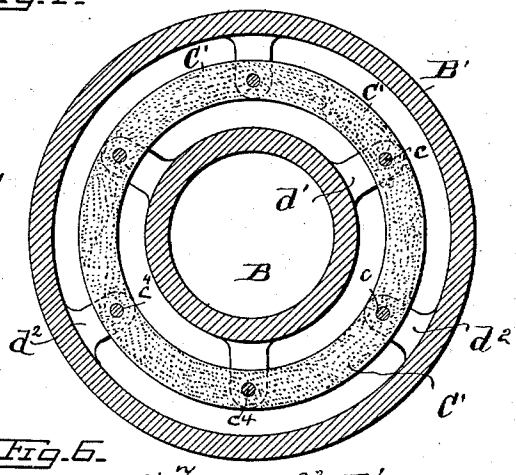


Fig. 5.

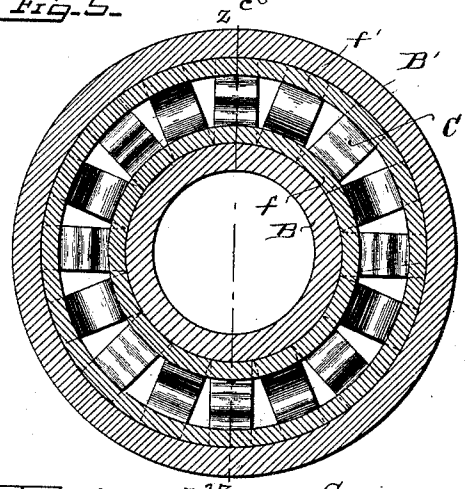


Fig. 6.

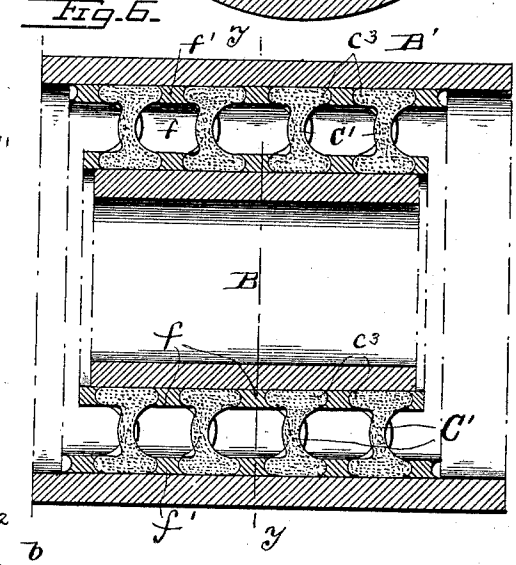


Fig. 1.

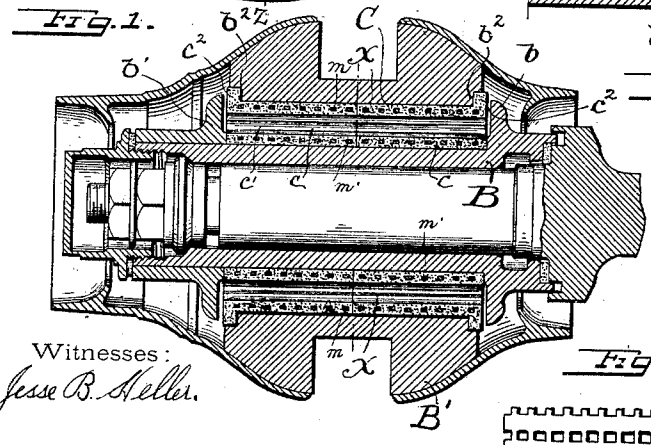


Fig. 2.

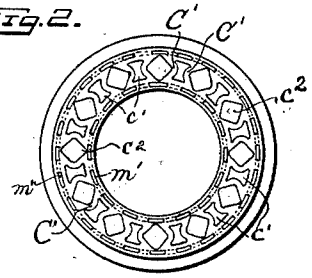
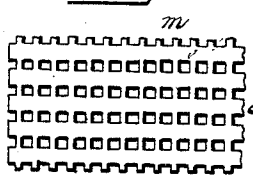


Fig. 7.



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JOHN WILLS CLOUD, OF CHICAGO, ILLINOIS.

WHEEL-HUB.

SPECIFICATION forming part of Letters Patent No. 519,807, dated May 15, 1894.

Application filed July 15, 1893. Serial No. 480,559. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLS CLOUD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wheel-Hubs, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to wheel hubs and particularly to such hubs as have an elastic band or stay in the hub to take up sudden shocks and jars.

Heretofore hubs have been constructed in two parts, an inner box to surround the axle or spindle and an outer shell, and an elastic band has been arranged between these two parts of the hub for the purpose of taking up sudden shocks. One of the disadvantages however of the constructions heretofore devised is, that the weight carried by the axle bears only on that part of the elastic support or filling which is below the box, and this elastic support being constantly put in a state of compression, tends, if made of rubber or other similar substance, to harden and crack so that its usefulness is destroyed or if it consists of spring to break. To obviate these objections is the main object of my invention and I accomplish this by so arranging the elastic support between the box and outer shell that practically all of the support will be put in action at the same time to aid in supporting any weight carried by the axle.

A further object of my invention is to arrange an elastic filling which will be easily placed in the wheel hub and readily replaced and to this end my invention consists in certain features of construction hereinafter more fully pointed out in the claims appended to this specification.

My invention is best understood by reference to the drawings which illustrate various wheel hubs provided with elastic fillings arranged according to my invention and in which—

Figure 1 is a sectional view of a wheel hub having my preferred form of elastic filling. Fig. 2 is an end view of the elastic filling in said hub. Fig. 3 is a sectional view of a hub on a line corresponding to the line $x\,x$ of Fig. 1 showing another mode of arranging the elastic material. Fig. 4 is a view similar to that shown in Fig. 3 and illustrating another mode of arrangement. Fig. 5 is a sectional view of a hub in the line $y\,y$ of Fig. 6 showing another mode of arranging the elastic supporting bands. Fig. 6 is a section on the line $z\,z$ of Fig. 5. Fig. 7 is a fragmentary view of a perforated cylinder which is mounted in the rubber filling as shown in Fig. 1.

B represents the inner box which is adapted to fit and rotate on a suitable axle or spindle.

B′ is the outer shell; and in the annular cavity between the box and shell is placed an elastic filling which is so arranged that the weight is not carried exclusively by that part of the elastic material which is below the box B but is carried by the whole of the material of the elastic support which is indicated by the general index C. There are obviously many modes of arranging this elastic support C so as to act in the manner specified but the modes of arrangement shown are those which are preferred.

In Fig. 1, $c\ c$ are two cylinders of rubber or other elastic and extensible material which constitute the elastic filling between the box and shell near the inner surface of the cylinders which I preferably mold with the rubber bands or rings m' which serve to hold the rubber or other elastic material securely against the box B similar bands m being arranged to hold the elastic material against the outer shell. Instead of simple bands or rings, bands or rings joined together by longitudinal connections to form a perforated cylinder as shown in Fig. 7 are preferably used. To apply these cylinders, which I preferably form with flanges c^2 to fit in grooves b^2 in the hub, they are pushed into the outer shell till they meet in the manner shown and then the whole pushed over the box till the elastic filling abuts against a collar as b on the box, a second collar as b' being conveniently arranged to secure the whole. While the rubber or other elastic filling is advantageously made solid still I prefer to core it out as shown at $c'\ c^2$ leaving a series of bow shaped stays C′ C′ which serve to support the shell concentrically with the hub and axle and at the same time have freer play as the entire space between the hub and axle is not filled up. In

Fig. 3 is illustrated another mode of supporting the outer shell; instead of securing the stays or supports C′ by means of bands *m m′* I form them with enlarged heads c^3 and form bevel slots or grooves *e e′* in the box and shell respectively into which the heads of the stays C′ fit as shown and so support the shell. Figs. 5 and 6 illustrate a very similar construction except that the stays C′ are arranged radially around the axle box instead of longitudinally along it as shown in Fig. 3 bevel rings *f′ f′* serving the same function as the bevel grooves *e′ e′*.

In Fig. 4 the stays or supports for the outer shell instead of being connected directly to the shell and hub are secured to pins or projections *d′* d^2 on the hub and shell respectively and the elastic bands or stays are secured to the projections *d′* d^2 by means of pins c^4.

While I have shown the elastic support in this case as a continuous band it is of course evident that several sections simply reaching from one projection to the next can be used, and also that as many sets of bands as may be desired may be set along the length of the hub. The action of the elastic filling under stress is of course obvious; that portion of the elastic filling or support which is below the box is compressed which results, in the constructions shown, in bending the stays C making them more bowed as shown at *n′* Fig. 3 while the stays above the box are subjected to a tension so as to be less bowed as shown at *n* Figs. 3 and 4 and if a very great weight must be borne by the axle those of the stays which are above the box will actually stretch but this will not happen under normal conditions.

The modes of arrangement shown permit of ready replacement of a worn filling and yet when the fillings are in position they are securely held and since the elastic stays are subjected to alternate compression and tension they do not lose their elasticity as quickly as when subjected to pressure alone. It is also evident that metallic springs could be substituted for rubber in many cases without departing from the spirit of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination in a wheel hub of a box B and an outer shell B′ with a number of normally curved independent sections, of elastic and extensible material arranged radially between the hub and wheel and held in contact with each of them whereby when a weight is borne by the hub the sections will be given both a bending and a stretching strain.

2. The combination in a wheel hub of a box B and an outer shell B′ with a series of rubber stays arranged to normally hold the box and shell concentric to each other, a metal band or ring embedded in said stays near their outer ends to hold them in contact with the shell and a metal band or ring embedded in said stays near their inner ends to hold them in contact with the box.

3. The combination in a wheel hub of a box B and an outer shell B′, collars *b b′* on the box and an elastic support for the outer shell B′ arranged between the collars and consisting of cylinders *c* having metallic bands or rings embedded in said cylinders near the inner and outer peripheries to hold the cylinders in contact with the box and shell.

4. The combination in a wheel hub of a box B and an outer shell B′ collars *b b′* on the box and an elastic support for the outer shell B′ arranged between the collars and consisting of cylinders *c* cored to form a series of stays C′ and having metallic bands or rings embedded in said cylinders near the inner and outer peripheries to hold the cylinders in contact with the box and shell.

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